

SEQUENCE LISTING

<110> Bayer BioScience N.V.
De Block, Marc

<120> Methods and means for increasing the tolerance of plants to stress conditions.

<130> BCS '03 2002 WO1

<150> EP03076044.1

<151> 2003-04-09

<150> US 60/496,688

<151> 2003-08-21

<160> 25

<170> PatentIn version 3.1

<210> 1

<211> 548

<212> PRT

<213> Arabidopsis thaliana

<400> 1

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Ser Thr Leu Glu Pro Ser Ala Ser Asn Gly Tyr Ala Phe Leu Phe Asp
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Arg Leu Leu Asn Ser Gln Gln Ala Gly Ile Val Phe Leu Ser Gln Glu
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| His | Tyr | Phe | Asp | Arg | Val | Thr | Ala | Ser | Thr | Pro | Thr | Gly | Ser | Val | Ser | | | | | | | | | | | | | | | | | | | | | | | | |
| 195 | | | | | | | | | | 200 | | | | | | | | | | 205 | | | | | | | | | | | | | | | | | | | |
| ttt | gag | cgt | aag | gtt | ctt | cct | cgc | cgt | cct | gaa | tct | gat | ggc | att | acg | | | | 672 | | | | | | | | | | | | | | | | | | | | |
| Phe | Glu | Arg | Lys | Val | Leu | Pro | Arg | Arg | Pro | Glu | Ser | Asp | Gly | Ile | Thr | | | | | | | | | | | | | | | | | | | | | | | | |
| 210 | | | | | | | | | | 215 | | | | | | | | | | 220 | | | | | | | | | | | | | | | | | | | |
| tac | cct | gac | atg | gat | act | tgg | atg | aaa | tct | ggg | gtt | ccc | ctt | tgc | aca | | | | 720 | | | | | | | | | | | | | | | | | | | | |
| Tyr | Pro | Asp | Met | Asp | Thr | Trp | Met | Lys | Ser | Gly | Val | Pro | Leu | Cys | Thr | | | | | | | | | | | | | | | | | | | | | | | | |
| 225 | | | | | | | | | | 230 | | | | | | | | | | 235 | | | | | | | | | | 240 | | | | | | | | | |
| ttc | cgg | gta | ttt | tcc | tca | ggc | ttg | ata | gaa | gat | gag | gaa | caa | gaa | gcc | | | | 768 | | | | | | | | | | | | | | | | | | | | |
| Phe | Arg | Val | Phe | Ser | Ser | Gly | Leu | Ile | Glu | Asp | Glu | Glu | Gln | Glu | Ala | | | | | | | | | | | | | | | | | | | | | | | | |
| 245 | | | | | | | | | | 250 | | | | | | | | | | 255 | | | | | | | | | | | | | | | | | | | |
| ctt | gaa | gtt | gac | ttt | gca | aat | aga | tat | ttg | gga | ggg | ggc | gca | ctt | tcc | | | | 816 | | | | | | | | | | | | | | | | | | | | |
| Leu | Glu | Val | Asp | Phe | Ala | Asn | Arg | Tyr | Leu | Gly | Gly | Gly | Ala | Leu | Ser | | | | | | | | | | | | | | | | | | | | | | | | |
| 260 | | | | | | | | | | 265 | | | | | | | | | | 270 | | | | | | | | | | | | | | | | | | | |
| aga | ggc | tgc | gtg | cag | gaa | gaa | atc | cgg | ttc | atg | ata | aac | cca | gaa | ttg | | | | 864 | | | | | | | | | | | | | | | | | | | | |
| Arg | Gly | Cys | Val | Gln | Glu | Glu | Ile | Arg | Phe | Met | Ile | Asn | Pro | Glu | Leu | | | | | | | | | | | | | | | | | | | | | | | | |
| 275 | | | | | | | | | | 280 | | | | | | | | | | 285 | | | | | | | | | | | | | | | | | | | |
| atc | gtg | ggc | atg | ctc | ttc | atg | gtt | tca | atg | gaa | gat | aat | gaa | gct | ata | | | | 912 | | | | | | | | | | | | | | | | | | | | |
| Ile | Val | Gly | Met | Leu | Phe | Met | Val | Ser | Met | Glu | Asp | Asn | Glu | Ala | Ile | | | | | | | | | | | | | | | | | | | | | | | | |
| 290 | | | | | | | | | | 295 | | | | | | | | | | 300 | | | | | | | | | | | | | | | | | | | |
| gaa | att | gtt | ggg | gca | gaa | agg | ttc | tca | cag | tac | atg | ggg | tat | ggg | tcc | | | | 960 | | | | | | | | | | | | | | | | | | | | |
| Glu | Ile | Val | Gly | Ala | Glu | Arg | Phe | Ser | Gln | Tyr | Met | Gly | Tyr | Gly | Ser | | | | | | | | | | | | | | | | | | | | | | | | |
| 305 | | | | | | | | | | 310 | | | | | | | | | | 315 | | | | | | | | | | 320 | | | | | | | | | |
| tca | ttc | cgt | ttt | act | ggg | gac | tac | tta | gat | agc | aaa | ccc | ttt | gat | gcg | | | | 1008 | | | | | | | | | | | | | | | | | | | | |
| Ser | Phe | Arg | Phe | Thr | Gly | Asp | Tyr | Leu | Asp | Ser | Lys | Pro | Phe | Asp | Ala | | | | | | | | | | | | | | | | | | | | | | | | |
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| atg | ggg | aga | cgg | aaa | act | agg | ata | gtg | gca | att | gat | gct | ttg | gac | tgt | | | | 1056 | | | | | | | | | | | | | | | | | | | | |
| Met | Gly | Arg | Arg | Lys | Thr | Arg | Ile | Val | Ala | Ile | Asp | Ala | Leu | Asp | Cys | | | | | | | | | | | | | | | | | | | | | | | | |
| 340 | | | | | | | | | | 345 | | | | | | | | | | 350 | | | | | | | | | | | | | | | | | | | |
| cca | act | agg | tta | cag | ttt | gaa | tct | agt | ggg | ctt | cta | agg | gaa | gtg | aac | | | | 1104 | | | | | | | | | | | | | | | | | | | | |
| Pro | Thr | Arg | Leu | Gln | Phe | Glu | Ser | Ser | Gly | Leu | Leu | Arg | Glu | Val | Asn | | | | | | | | | | | | | | | | | | | | | | | | |
| 355 | | | | | | | | | | 360 | | | | | | | | | | 365 | | | | | | | | | | | | | | | | | | | |
| aag | gct | ttt | tgt | gga | ttt | ttg | gat | caa | tca | aat | cat | cag | ctc | tgt | gca | | | | 1152 | | | | | | | | | | | | | | | | | | | | |
| Lys | Ala | Phe | Cys | Gly | Phe | Leu | Asp | Gln | Ser | Asn | His | Gln | Leu | Cys | Ala | | | | | | | | | | | | | | | | | | | | | | | | |
| 370 | | | | | | | | | | 375 | | | | | | | | | | 380 | | | | | | | | | | | | | | | | | | | |
| aag | ctt | gtc | cag | gat | tta | aat | aca | aag | gat | aac | tgt | cca | agt | gtc | att | | | | 1200 | | | | | | | | | | | | | | | | | | | | |
| Lys | Leu | Val | Gln | Asp | Leu | Asn | Thr | Lys | Asp | Asn | Cys | Pro | Ser | Val | Ile | | | | | | | | | | | | | | | | | | | | | | | | |
| 385 | | | | | | | | | | 390 | | | | | | | | | | 395 | | | | | | | | | | 400 | | | | | | | | | |
| cct | gat | gaa | tgc | ata | gga | gtt | tca | act | gga | aac | tgg | ggg | tgc | ggg | gct | | | | 1248 | | | | | | | | | | | | | | | | | | | | |
| Pro | Asp | Glu | Cys | Ile | Gly | Val | Ser | Thr | Gly | Asn | Trp | Gly | Cys | Gly | Ala | | | | | | | | | | | | | | | | | | | | | | | | |
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Ser Gln Ala Leu Arg Ser Phe Ile Asn Tyr Tyr Thr Phe Glu Ser Glu
      435      440      445
tca ctg aaa aga tta gaa gag gtg acc cag tgg ata ttg cgc cat agg      1392
Ser Leu Lys Arg Leu Glu Glu Val Thr Gln Trp Ile Leu Arg His Arg
      450      455      460
tgg acg gtt ggc gag ttg tgg gac atg ctt gtg gag tat tca tcc cag      1440
Trp Thr Val Gly Glu Leu Trp Asp Met Leu Val Glu Tyr Ser Ser Gln
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Arg Leu Arg Gly Asp Thr Asn Glu Gly Phe Leu Thr Trp Leu Leu Pro
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Leu Lys Ala Leu Ala Leu Gly Pro Asp Val Ser Arg Val Ser Ser Gly
35      40      45
Asp Val Leu Ala Asp Ala Leu Thr Asp Leu Arg Leu Ala Leu Asn Leu
50      55      60
Asp Pro Leu Pro Arg Arg Ala Ala Glu Gly Phe Ala Leu Phe Phe Asp
65      70      75      80
Asp Leu Leu Ser Arg Ala Gln Ala Arg Asp Trp Phe Asp His Val Ala
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Pro Ser Leu Ala Arg Leu Leu Leu Arg Leu Pro Thr Leu Leu Glu Gly
100     105     110
His Tyr Arg Ala Ala Gly Asp Glu Ala Arg Gly Leu Arg Ile Leu Ser
115     120     125
Ser Gln Asp Ala Gly Leu Val Leu Leu Ser Gln Glu Leu Ala Ala Ala
130     135     140
Leu Leu Ala Cys Ala Leu Phe Cys Leu Phe Pro Thr Ala Asp Arg Ala
145     150     155     160
Glu Ala Cys Leu Pro Ala Ile Asn Phe Asp Ser Leu Phe Ala Ala Leu
165     170     175
Cys Tyr Asn Ser Arg Gln Ser Gln Glu Gln Lys Val Arg Cys Leu Val
180     185     190

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His Tyr Phe Asp Arg Val Thr Ala Ser Thr Pro Thr Gly Ser Val Ser
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 Phe Glu Arg Lys Val Leu Pro Arg Arg Pro Glu Ser Asp Gly Ile Thr
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 Tyr Pro Asp Met Asp Thr Trp Met Lys Ser Gly Val Pro Leu Cys Thr
 225 230 235 240
 Phe Arg Val Phe Ser Ser Gly Leu Ile Glu Asp Glu Glu Gln Glu Ala
 245 250 255
 Leu Glu Val Asp Phe Ala Asn Arg Tyr Leu Gly Gly Gly Ala Leu Ser
 260 265 270
 Arg Gly Cys Val Gln Glu Glu Ile Arg Phe Met Ile Asn Pro Glu Leu
 275 280 285
 Ile Val Gly Met Leu Phe Met Val Ser Met Glu Asp Asn Glu Ala Ile
 290 295 300
 Glu Ile Val Gly Ala Glu Arg Phe Ser Gln Tyr Met Gly Tyr Gly Ser
 305 310 315 320
 Ser Phe Arg Phe Thr Gly Asp Tyr Leu Asp Ser Lys Pro Phe Asp Ala
 325 330 335
 Met Gly Arg Arg Lys Thr Arg Ile Val Ala Ile Asp Ala Leu Asp Cys
 340 345 350
 Pro Thr Arg Leu Gln Phe Glu Ser Ser Gly Leu Leu Arg Glu Val Asn
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 Lys Ala Phe Cys Gly Phe Leu Asp Gln Ser Asn His Gln Leu Cys Ala
 370 375 380
 Lys Leu Val Gln Asp Leu Asn Thr Lys Asp Asn Cys Pro Ser Val Ile
 385 390 395 400
 Pro Asp Glu Cys Ile Gly Val Ser Thr Gly Asn Trp Gly Cys Gly Ala
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 Ser Leu Lys Arg Leu Glu Glu Val Thr Gln Trp Ile Leu Arg His Arg
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 Trp Thr Val Gly Glu Leu Trp Asp Met Leu Val Glu Tyr Ser Ser Gln
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| ttttctatcg | cgtattaaat | gtataattgc | gggactctaa | tcataaaaac | ccatctcata | 180 |
| aataacgtca | tgcattacat | gttaattatt | acatgcttaa | cgtaattcaa | cagaaattat | 240 |
| atgataatca | tcgcaagacc | ggcaacagga | ttcaatctta | agaaacttta | ttgccaaatg | 300 |
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| cggacggggc | ggtaccggca | ggctgaagtc | cagctgccag | aaacccacgt | catgccagtt | 420 |
| cccgtgcttg | aagccggccg | cccgcagcat | gccgcggggg | gcataatccga | gcgcctcgtg | 480 |
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| attatccttt | ggtgaaaagt | ctcaatagcc | ctttggtctt | ctgagactgt | atctttgaca | 1320 |
| tttttgaggt | agaccagagt | gtcgtgctcc | accatggtga | cgaagatttt | cttcttgtca | 1380 |
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| cctcatatca | actactacgt | tgtgtataac | ggtccacatg | ccggtatata | cgatgactgg | 1920 |
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| cttcccaaga | aggttaaaga | tgcagtcaaa | agattcagga | ctaattgcat | caagaacaca | 2460 |
| gagaaagaca | tatttctcaa | gatcagaagt | actattccag | tatggacgat | tcaaggcttg | 2520 |
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| ccattgcccc | gctatctgtc | acttcacga | aaggacagta | gaaaaggaag | gtggctccta | 2880 |
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| aaaaataaat | ttataaatat | attgtttaca | taaacaacat | agtaatgtaa | aaaaatatga | 3480 |
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| agcgtagat | gcactaagca | cataattgct | cacagccaaa | ctatcaggtc | aagtctgctt | 12780 |
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| gttctcaatg | gaaattatct | gcctaaccgg | ctcagttctg | cgtagaaacc | aacatgcaag | 13200 |
| ctccaccggg | tgcaaacgcg | cagcgg | | | | 13226 |